Fact Sheet



For Final Renewal Permitting Action Under 45CSR30 and Title V of the Clean Air Act

Permit Number: R30-03900005-2012 Application Received: April 1, 2011 Plant Identification Number: 03900005 Permittee: Union Carbide Corporation

Facility Name: Institute Plant

Business Unit: Glutaraldehyde (Group 4 of 5)

Mailing Address: P. O. Box 8361, South Charleston, WV 25303

Physical Location: Institute, Kanawha County, West Virginia

UTM Coordinates: 432.00 km Easting • 4,284.31 km Northing • Zone 17

Directions: From I-64, take the Institute exit, turn right onto State Route 25. Plant is

located about ½ mile west on Route 25.

Facility Description

Group 4 of 5 is the Glutaraldehyde Process Unit. Glutaraldehyde is produced by a reaction of methoxydihydropyran (MDP) with water in a reaction system. The reaction system effluent is pressured to a recovery system where glutaraldehyde is separated from methanol, a co-product of the reaction. Methanol and glutaraldehyde are recovered from the refining system. The glutaraldehyde is processed into different grades in blend tanks. Various grades of glutaraldehyde are shipped via tank truck, tote tanks, drums, and other small containers.

Emissions Summary

Glutaraldehyde (Group 4 of 5) Emissions Summary [Tons per Year]			
Pagulatad Pallutants	Potential Emissions		

Regulated Pollutants	Potential Emissions	2010 Actual Emissions
Carbon Monoxide (CO)	1.4	1.1
Nitrogen Oxides (NO _X)	0.3	0.2
Particulate Matter (PM _{2.5})	0.01	< 0.01
Particulate Matter (PM ₁₀)	0.01	< 0.01
Total Particulate Matter (TSP)	0.01	< 0.01
Sulfur Dioxide (SO ₂)	0.01	< 0.01
Volatile Organic Compounds (VOC)	15.0	4.8

 PM_{10} is a component of TSP.

Hazardous Air Pollutants	Potential Emissions	2010 Actual Emissions
Methanol	5.0	2.0

Some of the above HAPs may be counted as PM or VOCs.

Title V Program Applicability Basis

Due to the facility-wide potential to emit over 100 tons per year of criteria pollutant, over 10 tons per year of a single HAP, and over 25 tons per year of aggregate HAPs, Union Carbide Corporation's Institute Plant is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

This facility has been found to be subject to the following applicable rules:

Federal and State:	45CSR6	Open burning prohibited.
	45CSR7	Particulate matter and opacity limits for manufacturing sources.
	45CSR11	Standby plans for emergency episodes.
	WV Code § 22-5-4 (a) (14)	The Secretary can request any pertinent
		information such as annual emission
		inventory reporting.
	45CSR30	Operating permit requirement.
	45CSR34	Emission Standards for Hazardous Air
		Pollutants.
	40 C.F.R. Part 61	Asbestos inspection and removal
	40 C.F.R. 63, Subparts F, G, H	Hazardous Organic NESHAP (HON)
	40 C.F.R. Part 82, Subpart F	Ozone depleting substances

State Only: 45CSR4 No objectionable odors. 45CSR§\$21-37 and 40 Control of VOC Emissions

Each State and Federally-enforceable condition of the draft Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30

Active Permits/Consent Orders

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit (if any)
CO-R21-97-41	October 20, 1997	June 14, 2006 letter from J. L. Blatt
		October 7, 2011 letter from T. J. London

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table B," which may be downloaded from DAQ's website.

Determinations and Justifications

Changes to Title V Permit

1) **Section 1.1 Emission Units Table Changes.** The following changes were made to the Emission Units Table in Section 1.1:

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Control Device
T2074	175DD <u>177DD</u> ¹	Tank 2074	1952	None
T3101	175A	Tank 3101	1952 <u>/</u>	None
			Modified 2008 ²	
T3102 ²	175B ²	Tank 3102 ²	1952 ²	None ²
T3103 ²	175C ²	Tank 3103 ²	1952 ²	None ²
<u>T3110</u> ³	<u>175MM</u> ³	<u>Tank 3110</u> ³	<u>1994</u> ³	None ³
T3131 ⁴	175TT ⁴	Tank 3131 ⁴	Out of Service ⁴	None ⁴
<u>T3113</u> ⁵	<u>175LL</u> ⁵	<u>Tank 3113</u> ⁵	<u>2010</u> ⁵	None ⁵
<u>T3119</u> ³	<u>175NN</u> ³	<u>Tank 3119</u> ³	<u>1994</u> ³	None ³

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Control Device
<u>T3122</u> ⁶	<u>175QQ</u> ⁶	<u>Tank 3122</u> ⁶	2010 ⁶	None ⁶
<u>T3124</u> ⁶	<u>175RR</u> ⁶	<u>Tank 3124</u> ⁶	<u>2010</u> ⁶	None ⁶
<u>T3125</u> ⁶	<u>175SS</u> ⁶	<u>Tank 3125</u> ⁶	<u>2010</u> ⁶	None ⁶
<u>T3149</u> ⁷	<u>175YY</u> ⁷	<u>Tank 3149</u> ⁷	<u>1992/</u>	None ⁷
			Modified 2011 ⁷	
<u>C170</u> ⁸	<u>163A</u> ⁸	<u>Vessel C170</u> ⁸	Not Installed ⁸	<u>A163</u> ⁸
V29	170A or 163A	Vessel 29	1952 <u>/</u>	None or
			Modified 2008 ⁸	A163
L6TT	L6TT -or 163A 9	West Tank Truck Rack operated	1950s	None-or
		by Logistics Group		Flare A163 ⁹
TTWR ³	TTWR ³	Tank Truck Wagon ³	NA ³	None ³

The emission point ID for Tank 2074 was incorrect in the previous Title V permit and has been corrected.

- ² An existing three-compartment glutaraldehyde storage tank (Emission Unit IDs T3101, T3102, and T3103) was converted to a one compartment tank. The Emission Unit ID T3101 was retained as well as the Emission Point ID 175A. The entries for Emission Unit IDs T3102 and T3103 have been deleted. Tank T3101 has a design capacity less than 75 m³ and is not subject to 40 C.F.R. 60, Subpart Kb. This change was included in PD08-72.
- Two previously out of service tanks (Tanks 3110 and 3119) were added to the Glutaraldehyde Process to make blends from glutaraldehyde and other chemicals (not classified as hazardous air pollutants). Also, on occasion, Tank Truck Wagon is used to make the blends. Batch process vents are not subject to the HON MACT (per 40 C.F.R. §63.100(j)(4)). Batch process vents are subject to 40 C.F.R. 63, Subpart FFFF (MON MACT), however, these emission units are not batch process vents for the purposes of 40 C.F.R. 63, Subpart FFFF because the total uncontrolled HAP emissions are less than 200 lb/year. It should also be noted that the blended products are transferred to tank trucks for shipment, but since the materials loaded contain organic hazardous air pollutants as impurities, the transfer racks are not subject to the HON MACT (per 40 C.F.R. §63.100(f)(9)).

- ⁵ Tank 3113 was installed for glutaraldehyde service. The change did not result in any new applicable requirements. Tank 3113 has a design capacity less than 75 m³ and is not subject to 40 C.F.R. 60, Subpart Kb.
- ⁶ Three new methanol storage tanks were installed (Tanks 3122, 3124, and 3125). Each storage tank has a capacity of less than 75 m³; therefore they are not subject to 40 C.F.R. 60, Subpart Kb. The tanks are group 2 storage vessels subject to 40 C.F.R. 63, Subpart G (HON). These tanks have been added to Conditions 4.1.3 and 4.4.5. This change was included in PD08-72.
- ⁷ Tank 3149 was installed for glutaraldehyde service. 40 C.F.R 60, Subpart Kb does not apply to storage vessels with a capacity greater than or equal to 75 m³ but less than 151 m³ storing a liquid with a maximum true vapor pressure less than 15.0 kPa (40 C.F.R. §60.110b(b)). Tank 3149 meets this exemption.

⁴ Tank 3131 has been permanently removed from service.

- ⁸ Vessel C170 was added for a future installation and Vessel 29 was modified. These changes were included in PD08-72 and the details will be discussed below.
- ⁹ An error was corrected from the previous Title V permit. Emissions from the West Tank Truck Rack (L6TT) are not controlled by Flare A163.
- 2) **Updated Condition 3.7.2.** Condition 3.7.2 was revised as follows:
 - a. 40 C.F.R. 60, Subpart Kb "Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984. Because Tank 1501 has a capacity greater than 151 m³ storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kpa), 40 C.F.R. \(\) \(
 - b. 45CSR§7-4.2 Because the potential emissions of phosphoric acid from Tanks T2073, T2074, T2075, T2076, T2077, T4222, T4223, and T42223 are less than 0.1 lbs/hr per source and the aggregate for all sources is less than 100 pounds per year, 45CSR§7-10.6 exempts these tanks from the phosphoric acid concentration limits of 45CSR§7-4.2.
 - c. 40 C.F.R. 63, Subpart FFFF "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing." Tanks 3110 and 3119 and the Tank Truck Wagon (used for blending) are not batch process vents for the purposes of 40 C.F.R. 63, Subpart FFFF because the total uncontrolled HAP emissions are less than 200 lb/yr.
- Addition of Tanks 3122, 3124, and 3125 to Conditions 4.1.3 and 4.4.5. The three new methanol storage tanks installed in 2010 are subject to the provisions for Group 2 storage vessels under 40 C.F.R. 63, Subpart G. The only requirement for these storage vessels is to keep readily accessible records showing the dimensions of the storage vessel and an analysis showing the capacity of the storage vessel. The applicable requirements are stated in Conditions 4.1.3 and 4.4.5 and these tanks have been added to the listing of affected emission units.
- 4) Changes to Process Distillation Operations (V29) and addition of an In-Series Reactor (C170) submitted under PD08-72. On October 1, 2008, UCC Institute submitted a permit determination for various changes planned at the Glutaraldehyde Plant, two of which involved the addition of an in-series reactor (C170) and changes to the process distillation operations (V29). UCC Institute was notified by a letter from the Director of DAQ, dated October 30, 2008, that the proposed changes would not require a permit under 45CSR13.

The new in-series reactor (C170) which has not yet been installed is subject to the requirements of 40 C.F.R. 60, Subpart RRR – "Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes." However, according to 40 C.F.R. §63.110(d)(9), if the owner or operator of a process vent subject to 40 C.F.R. 63, Subpart G that is also subject to 40 C.F.R. 60, Subpart RRR elects to control the process vent to the levels required in 40 C.F.R. §863.113(a)(1) or (a)(2) without calculating the TRE index value for the vent according to the procedures specified in 40 C.F.R. §63.115(d), then the owner or operation shall comply with the testing, monitoring, reporting, and recordkeeping provisions of 40 C.F.R. 63, Subpart G and shall be exempt from the testing, monitoring, reporting, and recordkeeping provisions of 40 C.F.R. 60, Subpart RRR. Since C170 will be routed to Flare A163, UCC Institute will comply with the Group 1 process vent provisions of

40 C.F.R. §63.113(a)(1). Therefore, C170 has been added to the listing of Group 1 process vents in Conditions 4.1.1, 4.2.1, 4.4.1, 4.4.2, 4.5.3, and 4.5.4 and no additional testing, monitoring, reporting, and recordkeeping requirements under 40 C.F.R. 60, Subpart RRR are required.

The distillation system vent (V29) was already a Group 1 process vent subject to the 40 C.F.R. 63, Subpart G requirements specified in Conditions 4.1.1, 4.2.1., 4.4.1, 4.4.2, 4.5.3, and 4.5.4. The changes to the process distillation operations proposed in PD08-72 resulted in reconstruction under 40 C.F.R. 60, Subpart NNN – "Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations." According to 40 C.F.R. §63.110(d)(4), a Group 1 process vent that is also subject to the provisions of 40 C.F.R. 60, Subpart NNN is required to comply only with the provisions of 40 C.F.R. 63, Subpart G. Since V29 was already included as a Group 1 process vent, no changes were required to the Title V permit.

Changes to Equipment Leak Provisions for the Glutaraldehyde Plant. Process piping changes described in PD08-072 resulted in an increase in the number components covered by 45CSR§21-37, 40 C.F.R. 60, Subpart VV, and 40 C.F.R. 63, Subpart H. When these changes were made, the facility implemented plant wide leak detection and repair monitoring in accordance with 40 C.F.R. 63, Subpart H. 40 C.F.R. §63.160(c)(1), states that if a process unit subject to the provisions of 40 C.F.R. 63, Subpart H has equipment to which this subpart does not apply, but which is subject to 40 C.F.R. 60, Subpart VV, the owner or operator may elect to apply 40 C.F.R. 63, Subpart H to all such equipment in the process unit. If the owner or operator elects this method of compliance, all VOC in such equipment shall be considered, for purposes of applicability and compliance with 40 C.F.R. 63, Subpart H as if it were organic hazardous air pollutant (HAP).

As a result, condition 4.1.6 has been modified as follows:

"Equipment Leaks. The permittee shall comply with all applicable standards of 40 C.F.R. 63, Subpart H – "National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks." The pertinent equipment leak standards include: 40 C.F.R. §§63.162 (Standards: General), 63.163 (Standards: Pumps in light liquid service), 63.168 (Standards: Valves in gas/vapor service and in light liquid service), 63.169 (Standards: Pumps, valves, connectors, and agitators in heavy liquid service; instrumentation systems; and pressure relief devices in liquid service), and 63.171 (Standards: Delay of repair). For equipment which is not subject to 40 C.F.R. 63, Subpart H, but which is subject to 40 C.F.R. 60, Subpart VV, the permittee has elected to apply 40 C.F.R. 63, Subpart H to all such equipment in the process unit. All VOC in such equipment shall be considered, for purposes of applicability and compliance with 40 C.F.R. 63, Subpart H as if it were organic hazardous air pollutant (HAP). Compliance with the provisions of 40 C.F.R. 63, Subpart H shall be deemed to constitute compliance with 40 C.F.R. 60, Subpart VV. [45CSR34; 40 C.F.R. 63, Subpart H; 40 C.F.R. §§63.160(c)(1), 63.162, 63.163, 63.168, 63.169, and 63.171]."

6) Addition/Deletion of Requirements and Changes to the Numbering of the Title V Permit. The following conditions have been added, deleted, or renumbered as part of this Title V permit renewal:

Condition Number in R30-03900005-2006 (4 of 5) (AA02)	Condition Number in R30-03900005-2012 (4 of 5)	Explanation, if needed.
	3.3.1.d	Added new testing boilerplate.
4.5.3		"Reserved" was removed.
4.5.4	4.5.3	Renumbered
4.5.5	4.5.4	Renumbered
4.5.6	4.5.5	Renumbered
4.5.7	4.5.6	Renumbered
4.5.8	4.5.7	Renumbered
4.5.9	4.5.8	Renumbered

Condition Number in R30-03900005-2006 (4 of 5) (AA02)	Condition Number in R30-03900005-2012 (4 of 5)	Explanation, if needed.
4.5.10	4.5.9	Renumbered
4.5.11	4.5.10	Renumbered
4.5.12	4.5.11	Renumbered

40 C.F.R. 64 - Compliance Assurance Monitoring (CAM)

According to 40 C.F.R. §64.2(a), CAM applies to a pollutant-specific emissions unit at a major source that is required to obtain a part 70 or 71 permit if the unit satisfies all of the following criteria: 1) The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emission limitation or standard that is exempt under 40 C.F.R. §64.2(b)(1); 2) The unit uses a control device to achieve compliance with any such emission limitation or standard; and 3) The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. 40 C.F.R. §64.2(b)(1)(i) exempts emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act.

The Glutaraldehyde Process Unit has the following equipment with emission controls:

Emission Unit ¹	Emission Unit Description	Control Device	Emission Point
B170	Vessel B170		
C170	Vessel C170	Flare A163	163A
V29/A170	Vessel 29/Vessel A170	Trate A103	103A
L5RC (aka L5TC)	West Rail Car Rack		

Although listed in the Emission Units Table in Section 1.1 of the Title V permit renewal as an emission unit that vents to Flare A163, KOP is a knockout pot to collect liquid in the gas stream, if any, before it reaches the flare.

Flare A163 is used to control VOC and HAP emissions from the various emission units listed above. The only emission limitations these units are subject to are the HAP requirements under 40 C.F.R. 63, Subpart G and a VOC emission limit from CO-R21-97-41 for emission point 163A. Since 40 C.F.R. §64.2(b)(1)(i) exempts emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act, the emission units only need to be evaluated for CAM applicability on the basis of their VOC emissions. All of the emission units listed in the table above have potential pre-control device VOC emissions of less than 100 tons per year; therefore they are not subject to CAM.

Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. Since the Union Carbide Corporation's Institute Plant has not submitted any applications for a modification under PSD after January 2, 2011, the requirements of the Greenhouse Gas Tailoring Rule do not apply.

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

40 C.F.R. 60, Subpart Kb – "Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984. Because Tank 1501 has a capacity greater than 151 m³ storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kpa), 40 C.F.R. §60.110b(b) exempts it from the requirements of 40 C.F.R. 60, Subpart Kb. Tanks 3101, 3113, 3122, 3124, and 3125 each have design capacities less than 75 m³ and are not subject to 40 C.F.R. 60, Subpart Kb. 40 C.F.R 60, Subpart Kb does not apply to Tank 3149 because it has a design capacity greater than or equal to 75 m³ but less than 151 m³ storing a liquid with a maximum true vapor pressure less than 15.0 kPa (exempt per 40 C.F.R. §60.110b(b)).

- b. 45CSR§7-4.2 Because the potential emissions of phosphoric acid from Tanks T2073, T2074, T2075, T2076, T2077, T4222, T4223, and T42223 are less than 0.1 lbs/hr per source and the aggregate for all sources is less than 100 pounds per year, 45CSR§7-10.6 exempts these tanks from the phosphoric acid concentration limits of 45CSR§7-4.2.
- c. 40 C.F.R. 63, Subpart FFFF "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing." Tanks 3110 and 3119 and the Tank Truck Wagon (used for blending) are not batch process vents for the purposes of 40 C.F.R. 63, Subpart FFFF because the total uncontrolled HAP emissions are less than 200 lb/yr.

Request for Variances or Alternatives

None.

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date: February 13, 2012 Ending Date: March 14, 2012

All written comments should be addressed to the following individual and office:

Carrie McCumbers
Title V Permit Writer
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Point of Contact

Carrie McCumbers
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Division of Air Quality
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No comments were received.

Response to Comments (Statement of Basis)